Virginia Information Technologies Agency

VITA

FY19

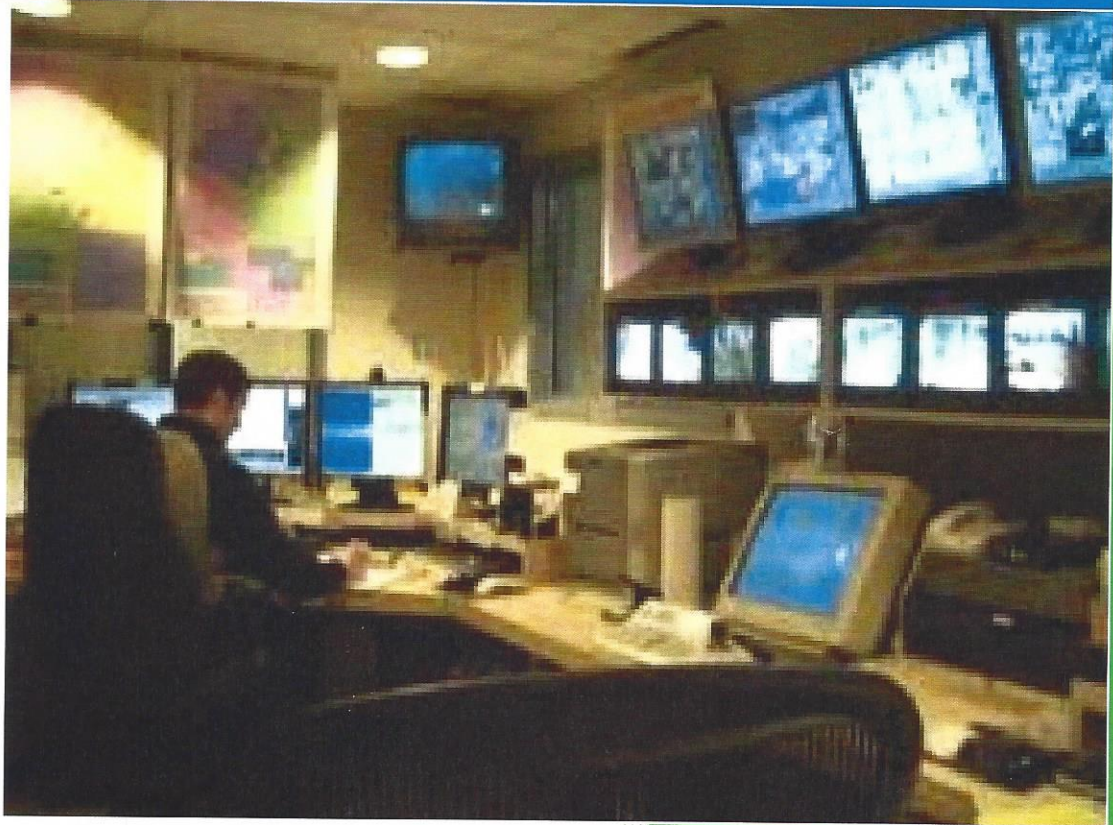## NG-911 GRANT PROGRAM APPLICATION

VIRGINIA INFORMATION
TECHNOLOGIES AGENCY
Integrated Services Division

FY19 NG-911 GRANT PROGRAM
APPLICATION

HOW TO APPLY/DEADLINE

The grant application is available and accessible from VITA ISP's website (http://www.vita.virginia.gov/isp/default.aspx?id=8578). Upon completion of the application, it is to be submitted to the electronic mailbox for grant applications - psapgrants@vita.virginia.gov. Any supporting documentation must also be submitted along with the application when making your grant application submission.

After the close of the grant application cycle, a Grant ID and email receipt notification will be sent to the e-mail address listed on the application received.

All funding requests must be submitted using the grant application. Technical assistance is available from VITA's Public Safety Communications (PSC) staff throughout the grant process. The FY19 NG-911 Grant Application Cycle starts July 1, 2017 and concludes on September 30, 2017 at 5:00 pm.

ALL APPLICABLE SECTIONS MUST BE COMPLETED IN ITS ENTIRETY OR THE APPLICATION WILL BE CONSIDERED INCOMPLETE AND NOT ACCEPTED FOR CONSIDERATION.

FY19 NG-911 GRANT APPLICATION

PROJECT TITLE

Culpeper GIS NG911 Mapping

GRANT APPLICANT PROFILE/PROJECT CONTACT

PSAP/HOST PSAP NAME: Culpeper County Public Safety Communications Center
CONTACT TITLE: Director
CONTACT FIRST NAME: William
CONTACT LAST NAME: Martin
ADDRESS 1: 14022 Public Safety Ct
ADDRESS 2: Click here to enter text
CITY: Culpeper
ZIP CODE: 22701
CONTACT EMAIL: WMARTIN@CULPEPERCOUNTY.GOV
CONTACT PHONE NUMBER: 540-727-8800
CONTACT MOBILE NUMBER: 540-423-7190
CONTACT FAX NUMBER: 540-727-9554
REGIONAL COORDINATOR: Amy Ozeki

HOST PSAP AND PARTICIPATING PSAPS/LOCALITIES

GRANT TYPE

☒ Individual PSAP   ☐ Shared Services

Non-vendor supported application MUST include age and/or version of hardware/software, along with a copy of the notice from the vendor.

VERSION: _____   # YEARS of HARDWARE/SOFTWARE: _____

PRIORITY/PROJECT FOCUS   NG 9-1-1 GIS

FINANCIAL DATA

Amount Requested: $ $39,340.00
Total Project Cost: $ $39,340.00

PROJECT DESCRIPTION

Provide a detailed description of the project for which funding is being sought, including the impact on operational services and consequences of not receiving funding; the relationship to local strategic and capital improvement plans; and sustainability:

Culpeper County Public Safety Communications Center is requesting the NG9-1-1 PSAP Grant to assist with updating our GIS data for the Town and County of Culpeper. Over the next several years, the Commonwealth of Virginia will transition to the Next Generation 9-1-1. With the understanding that GIS is critical to NG9-1-1 call delivery, special emphasis is being placed on GIS data readiness. This requires our localities (Town of Culpeper & County of Culpeper to work to not only get their GIS data correct, but to implement the necessary processes and procedures to KEEP our data correct. The Town and County GIS team has reached out to DATAMARK to assist them with cleaning up our data. DATAMARK will perform a GIS addressing assessment report. This assessment will evaluate the current workflows that manage address creation and maintenance within our jurisdiction. In addition, this assessment will review the GIS schema, processes and procedures that manage both centerline and address related to the NG9-1-1 schema structure for centerlines, address points, PSAP and emergency service boundaries, organizational structure, roles and responsibilities, and address maintenance workflow. Both the Culpeper Town & County GIS departments are limited to one employee each. Even though our data looks ok, we are very concerned that if we are not granted this grant that our data may not be as accurate and we do not have the staff or the expertise with our current programs.

PROJECT GOAL

Describe how this project addresses locally identified need(s) and supports the Virginia 9-1-1 Comprehensive Plan:

This will evaluate the current workflows that manage address creation and maintenance within our jurisdiction. In addition, this assessment will review the GIS schema, processes and procedures that manage both centerline and address point creation, maintenance, and deletion. The assessment will include recommendations that relate to the NG9-1-1 GIS schema structure for centerlines, address points, PSAP and emergency service boundaries, organizational structure, roles and responsibilities, and address maintenance workflow.

PROJECT OBJECTIVES

Describe the objectives that will support the goals identified above:

In support of Next Generation 9-1-1, this product and services support both the Town and County of Culpeper GIS departments as we migrate to Next Generation 9-1-1. DATAMARK have a customizable program that will meet our needs with advance GIS programs. Our goal, to the fullest extent possible to make our GIS departments self-sufficient and address our needs for the NG9-1-1 Environment for responsible for accuracy in our GIS addressing system.

SHARED SERVICES (if applicable)

IMPLEMENTATION PLAN
SHARED SERVICES & INDIVIDUAL PSAP APPLICATIONS:

For each applicable phase of the project, indicate the planned completion date.

Describe the relationship of the project to the participating PSAPs:

Click here to enter text

Describe the intended collaborative efforts and resource sharing opportunities:

Click here to enter text

PROJECT PHASE	PLANNED COMPLETION DATE
INITIATION — Project concept is documented, local board or governing authority approval or endorsement is received, NG-911 Grant application is filed, local budgets are obtained, appropriated grant funds are approved, and budgetary estimates are obtained.	**12 / 15 / 2017**
DESIGN/PLANNING - Requirements are documented, components to be purchased are identified, and general design is documented.	**02/ 15 / 2018**
ACQUISITION - RFP (or other bid related processes) are drafted, proposals are evaluated, contract is signed, purchase orders are issued, and quotes are obtained.	**07 / 30 / 2018**
IMPLEMENTATION - Purchased components are delivered and installed and training is performed	**08 / 30 / 2018**
TESTING/COMPLETION - Performance of system/solution is validated and system/solution goes "live"	**11 / 30 / 2018**

BUDGET AND BUDGET NARRATIVE

List the planned expenditures to be made with grant funds. Briefly explain the reason for each requested budget item and provide the basis for its cost. In addition, if contingency cost has been added, please identify the amount.

NOTE: In lieu of a line item breakdown, an itemized cost schedule or detailed vendor prepared quote may be submitted as an attachment, but a narrative is still required. However, budgetary quotes received from a particular vendor(s) during the application process do not commit the PSAP to use that vendor(s) once the grant is awarded.

1. GIS Addressing Assessment Report $12,840
2. Data Mark Addressing Completeness/Assessment/Correction $14,500
3. Data Mark DX Address Editing and Clean-up Support Services $11,950
4. Contingency (10%) $3,937
                              Total $ 39,340

EVALUATION

How will the project as identified in the project description be evaluated and measured for achievement and success:

Based on the results of the Data Mark Report Card, the Town and County of Culpeper GIS team will work with Michael Baker International with training our staff in the process of address data cleanup using the Data Mark DX. Because an accurate level of effort cannot be determined until the Report Card is complete, this cost proposal includes an optional funding amount that would be accessed only upon customer approval.
• Data Exchange (DX) for Quality Control.
• The DX is a geospatial SaaS (cloud-hosted software as a service) application that acts as a robust translator and repository of geospatial data. The system enforces that all data meet the stringent quality control standards based upon best practices associated with current National Emergency Number Association (NENA) standards.
• These data quality validation checks are built into the system but which ones are enforced are initially configurable for the end-user. Once the GIS data is fixed Culpeper GIS staff will continue to work together in maintaining 9-1-1 GIS data up-to-date and compliant to required standards.

PHYSICAL CONSOLIDATION - (complete only if applicable)

How would a consolidation take place and provide improved service:

Click here to enter text

How should it be organized and staffed:

Click here to enter text

What services should it perform:

Click here to enter text

How should policies be made and changed:

Click here to enter text

PHYSICAL CONSOLIDATION - (complete only if applicable) – continued

How should it be funded:

Click here to enter text

What communication changes or improvements should be made in order to better support operations:

Click here to enter text

PSAP GRANT SCOPE OF WORK PROPOSAL

Michael Baker International's Public Safety GIS Team has developed a suite of state of the products and services that we call DATAMARK™ GIS for 9-1-1. These products and services support jurisdictions as they plan for and migrate to Next Generation 9-1-1. They are customizable, and will meet the needs of jurisdictions with advanced GIS programs - - all they way to smaller counties that have no GIS staff at all. Our goal, to the fullest extent possible, is to make you as self-sufficient as you want to be. In the Next Generation 9-1-1 environment, localities will be responsible for the accuracy of their GIS addresses. This new responsibility will not go away for the foreseeable future. The most efficient and effective path forward is to leverage the products and services that will help you do just that. We hope to get you there!

NG9-1-1 GIS Planning, Assessment, Validation, and Reconciliation

Over the next several years, the Commonwealth of Virginia will transition to Next Generation 9-1-1. With the understanding that GIS is critical to NG9-1-1 call delivery, special emphasis is being placed on GIS data readiness. This requires that localities work to not only get their GIS data correct, but to implement the necessary processes and procedures to KEEP your data correct. DATMARK GIS for NG9-1-1 will get you there!

The following scope of work proposal includes a range of options that will allow you to select the best combination to meet your specific needs.
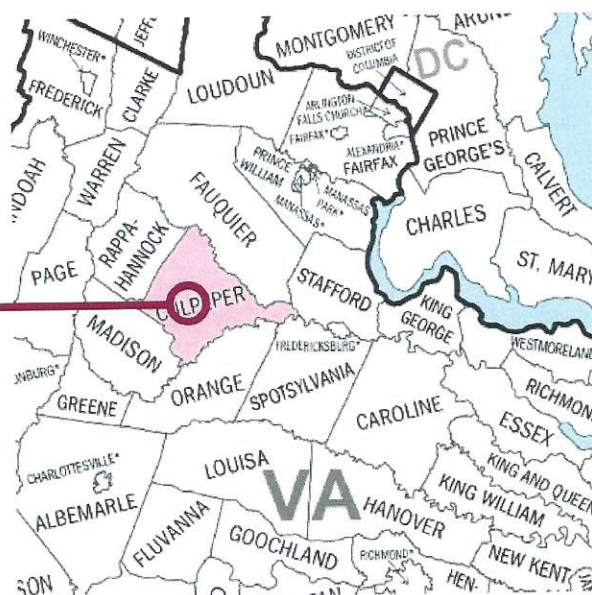
CULPEPER COUNTY, VIRGINIA
Naturally blending a rich history with a prosperous future.

Area: 383 mi²
Population: 49,388 (2016)
Communities Include: Culpeper, Boston, Elkwood, Richardsvillle, and Winston

DATAMARK ADDRESS ASSESSMENT & ACTION PLAN

As an initial step in the process to determine the level of effort that will be required for the one-time data clean up and ongoing maintenance of the required GIS data for NG9-1-1, the DataMark suite of solutions offers the DataMark Address Assessment and Action Plan.

Philosophy

Our Goal is to train you and your staff so that you become self-sufficient in the entire lifecycle of address maintenance. We will provide you the tools that will allow you to create, QC, correct, and maintain your addresses to NG9-1-1 specifications.

This Action Plan assesses your current address maintenance procedures, the completeness of your address point dataset, and the standardization of your datasets (attributes and spatial precision) via our QC desktop tool and finally a synchronization of your MSAG and ALI database to your GIS location data.

WHY DATAMARK GIS FOR NG9-1-1?

1 National Program

2 Technical Experts

3 Signature Projects

4 Based in Virginia!

1. NG9-1-1 GIS Data Assessment Report

WHY? The GIS Addressing Assessment Report will ensure that you are currently using the most efficient way to maintain your addresses.

Working with your PSAP Director and appropriate staff, Michael Baker International will perform a GIS Addressing Assessment Report. This Assessment will evaluate the current workflows that manage address creation and maintenance within your jurisdiction. In addition, this assessment will review the GIS schema, processes and procedures that manage both centerline and address point creation, maintenance, and deletion. The assessment will include recommendations that relate to the NG9-1-1 GIS schema structure for centerlines, address points, PSAP and emergency service boundaries, organizational structure, roles and responsibilities, and address maintenance workflow.

Tasks

- Staff interviews
- Documentation of existing addressing process workflow
- Documentation of current GIS maintenance and storage procedures
- Review of NG9-1-1 GIS schema structure for centerlines, address points, PSAP and emergency service boundaries
  - County of Culpeper and Town of Culpeper have different address database schemas
  - The two datasets will be merged and will share the same schema

Deliverables

- Culpeper NG9-1-1 GIS Data Assessment Report

2. DataMark NG9-1-1 GIS Data Completeness and Readiness Assessment

WHY? You may not have all the addresses in your current database. We will search other databases for additional addresses that don't exist in your current inventory. Next, we will compare your GIS data with the phone company's location data and look for any anomalies.

a.   Address Completeness Evaluation Report

The Address Completeness Evaluation report provides jurisdictions with a list of potential missing address candidates, based on the comparison analysis from other databases. The process involves matching non-GIS databases that contain local addresses to the list of unique civic locations from the address point layer. The potential address candidates are given a confidence ranking that is based upon how many disparate databases are found and ability to be synchronized by the US postal service and 9-1-1 databases.

b.   Readiness Assessment

The Readiness Assessment will perform the following analysis.

Address Point Anomalies

This section describes the checks conducted on the address point layer. Address points allow for the greatest level of spatial granularity when spatially locating a civic address of a 9-1-1 caller. If available, address points will serve as the first reference dataset to determine the location of incoming calls with an associated civic address in an NG9-1-1 call routing system. The address points will also serve as the first database to validate an internet or phone provider's subscriber location information via the LVF. Accurate address points are especially paramount for the ECRF. There are many methods to place address points (rooftop, access point, entrance point) and various way to handle multi-unit structures. Whatever the method, it is imperative to ensure that the location of the point is located in the proper PSAP and emergency response boundaries.

Address Points with Null Geometry or Invalid Geometry

Address points with null geometry do not have shape or form. Despite having a record in the address point shapefile, there is no associated geometry. Every address record in the spatial database should have an associated spatial location. Address points with invalid geometry have correct form but incorrect spatial reference. These records, if provisioned to the NG9-1-1 system, could not be associated with their proper PSAP or emergency service boundary due to their lack of correct spatial information.

Address Points Missing Street Name and Non-Integer Address Number

Address points in this anomaly category do not have a street name. Street names serve as a major component in identifying a unique civic address location. Address points with missing street names should be checked to confirm no street name has been assigned to the feature they represent. Per NENA's NG9-1-1 GIS Data model, the address number house field should only include integers. Address points with address number suffix or prefix information will need to be broken out into their root elements (address number prefix, address number, address number suffix). Address points without any house numbers (including 0) are also flagged because house numbers are a major component in locating a unique civic address location.

Address Point Duplication

In an NG9-1-1 system, each address point should represent a unique address. In the NG9-1-1 data model for address points, there are additional fields that enable a GIS authority to uniquely identify an address point that may share a common primary address (see Appendix A). These attributes include building, floor, unit, room, landmark, and additional location information. For this exercise, the pre direction, house number, street name, and street type were concatenated together to create a consistent formulated full address field. A frequency was then run on the concatenated address field to determine full addresses that were repeated in the address point dataset. Ideally, additional descriptive information would be provided for each point such as building name or unit information. Duplicate address points may be problematic for an ECRF solution because there is not one unique position on the earth to perform the point in polygon analysis to derive the correct PSAP and emergency services. Theoretically, a duplicate point could fall in two or more boundary polygons creating even more confusion.

Address Points Not Reflected In Centerline

Address points in this category could not be perfectly matched to the street centerline file based on its complete street name. This can occur due to a number of issues including street misspellings, inconsistent street directional, inconsistent street types, or potentially missing streets. It is important to have consistency between the centerline file and address point file before provisioning the data to an NG9-1-1 system.

Address Points Out of Order

Addresses typically follow a sequential order either moving higher or lower as one traverses a particular direction along a street. This check flags addresses that do not follow the expected flow of increasing or decreasing address street numbers.

Address Point Out of Range/On Wrong Block

Address points flagged in this category contain an address number that falls outside the address range of the centerline segment it is associated with. The centerline segment for which the address point is compared against must share the same street name components and be the shortest planar distance from the address point. Ideally address points should fall along the street segment it is associated with.

Address Point on Wrong Side of the Street

Address points flagged in this category contain an address number that falls on the opposite side of the street in accordance with address range parity in the centerline. It is not uncommon to find that these errors come in groups where there is actually a parity error also present in the centerline and when corrected, the address point errors are no longer valid. Further, it is common to find even and odd addresses on the same side of the street in some historic areas. While they don't pose as fatal errors to the NG9-1-1 call routing systems, it is helpful to check all address point errors and mark valid anomalies that have been ground truthed as exceptions.

Address Point Snaps to Wrong Street

Sometimes, especially along a border, two addressing/GIS authorities can name addresses and centerlines a bit differently. When this happens, there is a mismatch of addresses and the road centerline they are closest to. While sometimes it's simply a case of snapping distance, it can also point out issues like the one below. In this example, you can see all of the addresses being associated with a road segment far away from them in the Address Point Out of Order check. You can see where this would cause some strange results. It is important to know where these issues are happening, because the address and GIS authorities need to agree on the proper split for authority on the road, AND the proper naming convention for the road to match the addresses on it. This is a coordination issue that has to be addressed.

Centerline Anomalies

This section contains anomalies in the street centerline layer. Centerlines are a required dataset in NENA's NG9-1-1 GIS data model. Street centerlines with address ranges allow for the estimation of civic address' spatial location by extrapolating its coordinates along the street centerline based on the segment's address range. The accuracy of address ranges is crucial, as it is imperative the resulting spatial location is located in the correct PSAP boundary for the ECRF. Street segments with "padded" ranges may result in estimated locations being far from the actual location of the physical structure. This can have serious consequences in an ECRF, especially if address points are not available. If address points are available, the centerlines will serve as a means to "catch" addresses not able to be located in the address point layer.

Street Centerlines with Null Geometry and Invalid Geometry

Centerlines with null geometry do not have shape or form. Despite having a record in the centerline shapefile, there is no associated geometry. Every centerline record in the spatial database should have an associated spatial location. Centerlines with invalid geometry have correct form but incorrect spatial reference. These records, if provisioned to the NG9-1-1 system, could not be associated with their proper PSAP or emergency service boundary due to their lack of correct spatial information.

Street Centerlines with Incomplete Address Ranges

Street centerlines in this category have either no address ranges in any attribute field or an address range "to" value but no "from" value or vice versa. Although it is acceptable to have no address range information for a particular side of a street segment or the entirety of a segment, a partial range is an indication of incomplete data entry.

LeftFromAddress	LeftToAddress
997	<Null>
0	0
0	0
<Null>	995

Street Centerlines Inconsistent From/To Address Range (Low/High)

Typically, a street segment's "from" address range is lower than the "to" range. Street segments in this category do not follow this pattern, but rather, have a "from" range that is higher than the "to" range. There may be cases where addresses ascend in different directions depending on the side of the street, however, these types of anomalies could cause a civic address to be geocoded at the wrong end of the street.


Street Centerlines Inconsistent Odd/Even Address Range Parity (Range Parity)

In this category, street centerline segments are flagged if the "to" and "from" ranges for a given side are not consistently even or odd. For example, the Left From field starts at 1 but the Left To field ends in an even number (like 98). This scenario could cause an address to be flagged as located on the wrong side of the street, thus address points may be flagged as errors additionally. If this centerline was along the boundary of a PSAP, the call could be routed to the wrong call center.

Street Centerlines Odd/Even Parity Possibly Flipped (Parity Flipped)

Street centerlines in this category contain address ranges that are not consistent with the odd and even distribution of associated address points. Centerlines are flagged if fifty percent or higher of their associated address points are located on the wrong side of the street when compared to the even and odd parity of the segment's address range. It is likely that the ranges are correct but just populated incorrectly in the To/From attribute fields of the Left and Right side road ranges
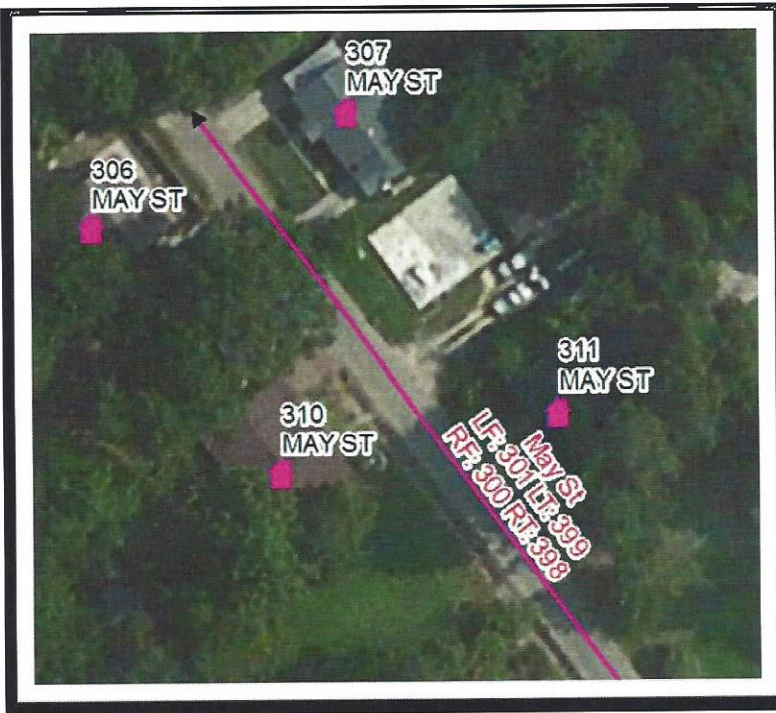
Street Centerlines Address Range Overlap

It is important that each unique address in a jurisdiction is represented by only one possible location in the GIS data (centerlines and address points). Centerline segments in this anomaly category contain ranges that overlap with another segment sharing the same name and area in the dataset. These overlaps can occur on the left, right, or both sides of the street segment. This would cause addresses to be located in two potential locations perhaps leading to a delay in the routing of the call. Address overlaps should be corrected so each position along a street centerline is unique.

Street Centerlines Inconsistent Vector Directionality

This check looks for road centerline address segments that may be pointing in the wrong direction. Often, a network will have already have been created, but not in all cases. Because directionality must agree with the right and left designations of the addresses, finding places where this is broken can fix a lot of other issues.

MSAG Anomalies

This section contains anomalies that exist between the Master Street Address Guide (MSAG) and the centerline attribute table. In that the MSAG is a tabular database of street names and house number ranges within their associated phone company communities, we have to do a tabular comparison. The ESN values in the MSAG define the extent on a road of a specific Emergency Service Zones (ESZs) to enable proper routing of 9-1-1 calls in the existing E9-1-1 environment. In an NG9-1-1 network, the centerlines (and potentially address points) will need to be able to "answer" the same questions that the current MSAG does, but spatially through geocoding. The result of geocoding the location of the 9-1-1 caller will be spatially joined to the Emergency Services Boundary files to determine which PSAP the call should be routed to.

We are not directing stakeholders to do a full MSAG to Centerline synchronization, but rather a comparison and reconciliation of errors in either database that would:

1. Prevent the centerline from answering the same questions the current MSAG can
2. Errors in the MSAG that in a transition state (current), would not route an E9-1-1 call correctly

A note about MSAG community: The community name associated with a MSAG record is assigned by the telephone provider in cooperation with the 9-1-1 Administrator and may or may not be the same as the community name assigned by the USPS. It is not necessary to use this attribute in the validation for NG9-1-1 thus it was not evaluated.

The transition to NG9-1-1 requires provisioning GIS street centerline data to the Emergency Call Routing Function (ECRF) that replaces the MSAG. Therefore, the 9-1-1 authority must ensure that every unique combination of street name, address range, and ESN are covered in the street centerlines. In order to make this possible the following checks help synchronize the MSAG and street centerline GIS data.

MSAG Has No Matching Street

Often, there is a mismatch in ESN, a spelling issue or a street type domain discrepancy in the MSAG versus what is maintained in a centerline. This validation identifies unique street names that appear in the MSAG but cannot be matched in the centerline table. The number of errors represents a street name, not the number of features in the MSAG for that street necessarily.

Street Centerline Has No Matching MSAG

Often, there is a mismatch or missing ESN, a spelling issue or a street type domain discrepancy in the centerline versus what is maintained in a MSAG. Further, a centerline file may contain alleys, trails, or other non-addressed or navigable roads which would not appear in a MSAG. This validation identifies unique street names that appear in the centerline but cannot be matched in the MSAG. The number of errors represents a street name, not the number of features in the centerline for that street necessarily. The features identified in this result do not necessarily equal an error in the centerline, but it is a good one time check to evaluate this because in an E9-1-1 environment a 9-1-1 call with an address that falls on a road not contained in the MSAG that should be there would be improperly routed.

MSAG Has No Matching Street Range

Sometimes a street centerline doesn't contain an address range that is found in the MSAG. This is not uncommon as MSAG files can contain the entire range of potential addresses for a road in a given GIS or addressing authority. Often centerlines only contain ranges where there are addresses. The features identified in this result do not necessarily equal an error in the centerline, but it is a good one time check to evaluate this because in a NG9-1-1 environment a 9-1-1 call with an address that falls in a range not contained in the centerlines would be improperly routed. This could point to an error in the MSAG or the street centerlines.

Street Centerline Has No Matching MSAG Range

Similarly, sometimes a MSAG doesn't contain an address range that is found in the street centerlines. This is a critical issue that analysis and reconciliation for should be prioritized. This anomaly will require deeper research as there may a reasonable explanation for why a range isn't found in the MSAG, but likely will require an update to the MSAG so in a transition period it can function properly. It may point to an ESZ change in which case the ESN may need to be updated in either the MSAG or the street centerline, or possibly both.

MSAG Has Zero Range

MSAG records should always have a range (values in the Low and High fields) to identify addresses along a stretch of street. There is no reason to have null, blank or "0" ranges in an MSAG. This anomaly will require follow up with the MSAG coordinator.

ALI Anomalies

This section contains anomalies in the Automatic Location Information database (ALI). The ALI contains customer information, telephone numbers, civic location information and ESNs to enable proper routing of 9-1-1 calls in the existing E9-1-1 environment. When a jurisdiction transitions to an end-state NG9-1-1, the ALI records will populate a Location Information Server. This is a database of locations that can transmit a 9-1-1 call.

The transition to NG9-1-1 requires provisioning data to the Emergency Call Routing Function (ECRF) and Location Validation Function (LVF) from centerline and address/structure points, the ALI records need to be geo-verified against the GIS data. Therefore, the 9-1-1 authority must ensure that every unique combination of address/structure number, street name, community and ESN are covered in the address point and centerline data. In order to make this possible the following checks help synchronize your ALI and GIS data.

ALI Has No House Number

A location cannot be valid without data in all of the required fields. House number is a required data field for civic locations and therefore must be populated. This anomaly will need to be fixed in the ALI database.

ALI Has No Matching Address Point

The synchronization of the ALI and Address Point data requires a 1:1 match. Some research may need to be done in the case where the ALI contains invalid location information. Some examples of why an ALI record can't be matched to an address point are: missing address points, a street naming conflict (ALI uses AV and address point uses AVE), a disconnected phone line (orphaned ALI record), ALI TN assigned to a non-situs address (ATM, etc.). Only in a case where you can verify it is a missing address point (must check against centerline first) should you add a new address point, otherwise, this is an ALI record that may not be valid and should be reported back to the 9-1-1 authority.

ALI Has No Matching Street Range

Because of the tight relationship between the ALI, Address Points, and Street Centerlines GIS data this anomaly points to a potential problem in the street centerline. If a civic location in the current ALI cannot be located by geocoding a location along a street centerline then a 9-1-1 call would be improperly routed in an NG9-1-1 environment. Some research may need to be done in the case

where the ALI contains invalid location information. In some cases a fix in the street centerlines will be required to address this anomaly.

PSAP Boundary Anomalies

This section contains anomalies in the PSAP Boundaries in the GIS data. It's important to note that PSAP Boundaries are most likely a new dataset in GIS as they were never required before. In almost every case, they will be different than the Emergency Service Zone (ESZ) boundaries which represent the boundary of the service area of the unique combination of law, fire and EMS responders.

The transition to NG9-1-1 requires the creation of a boundary that represents the service area of a primary PSAP (typically a law enforcement PSAP) a 9-1-1 call should be routed to.

Gaps and Overlaps

This anomaly indicates an area where, in an NG9-1-1 environment, a 9-1-1 call would be improperly routed because the ECRF wouldn't be able to ascertain a coordinate or civic location's proper call routing due to the fact that there is either 1) no polygon to query, or 2) multiple polygons to query. This anomaly is addressed by perfectly edge-matching PSAP boundaries so there are no gaps (cracks) or overlaps (slivers).

PSAP Missing Agency ID

Every PSAP is required to have an Agency ID. If this is missing the ECRF cannot provide the necessary information to the Emergency Services Routing Proxy (ESRP) which routes the call for service based on the location answer from the ECRF and the policies set forth by the PSAP itself. This anomaly is addressed by providing the Agency ID for each polygon in the PSAP Boundary GIS data.

Road Crosses PSAP

Street centerlines must be broken, and ideally edge-matched with their neighboring jurisdiction's corresponding street centerline, at a given PSAP boundary. This anomaly is addressed by breaking a street centerline at the boundary and confirming the address ranges between jurisdictions to insure proper call routing.

Road Not Covered by PSAP

This anomaly is likely the result of a gap in PSAP Boundary polygons. A street centerline must be covered by the corresponding PSAP Boundary polygon. This anomaly is addressed by either adjusting the endpoint of the street centerline or the polygon boundary.

Address Not Covered by PSAP

This anomaly is likely the result of a gap in PSAP Boundary polygons. An address point must be covered by the corresponding PSAP Boundary polygon. This anomaly is addressed by either adjusting the location of the address point(s) or the polygon boundary.

Address on PSAP Boundary

If an address point is located on a PSAP boundary a query may or may not return the proper result. The best way to prevent ambiguous query results is to move any address point that's on a PSAP boundary to be wholly contained within the PSAP boundary polygon.

Tasks

- Address Completeness Evaluation Report
  - Acquire County address databases (Schools, Utilities, Assessors, etc.)
  - Perform comparison analysis process involving data made available by the customer
- Readiness Assessment
  - Address Point
  - Centerline
  - MSAG and ALI
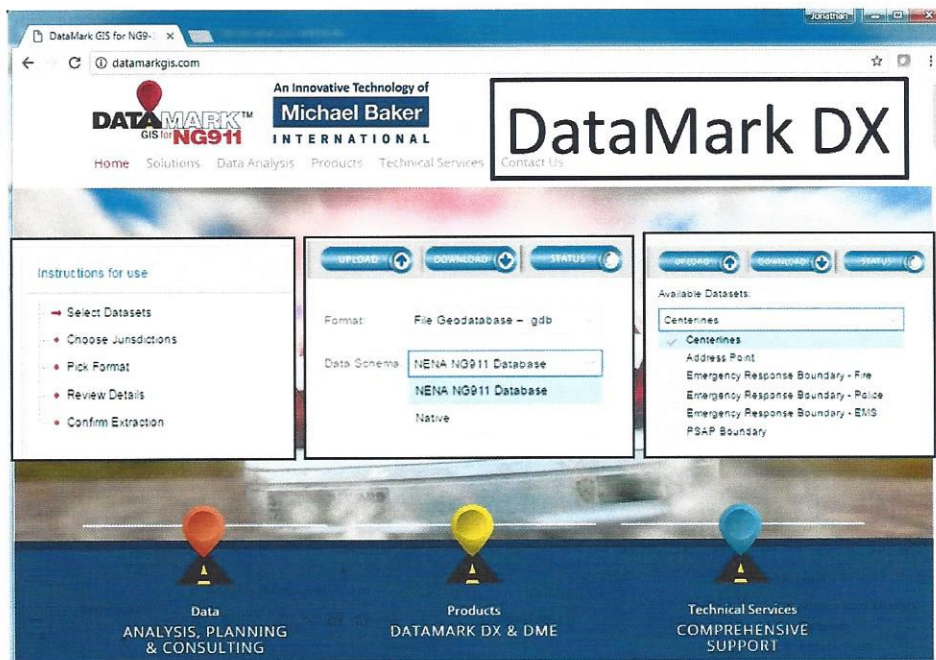 - PSAP Boundary

Deliverables

- Database of additional addresses that do not exist in the County's current address database
- Readiness Assessment Report with Related Table Anomaly Log File

3. DataMark DX Address Editing and Clean-up Support Services

WHY? Your address database is being updated all the time....it changes with each new development and/or street change. After you correct your data, you need a simple approach to ensure that it STAYS correct.

Based on the results of the DataMark Report Card, Michael Baker International will train your staff in the process of address data cleanup using the DataMark DX. Because an accurate level of effort cannot be determined until the Report Card is complete, this cost proposal includes an optional funding amount that would be accessed only upon customer approval.

- DataExchange (DX) for Quality Control.
- The DX is a geospatial SaaS (cloud-hosted software as a service) application that acts as a robust translator and repository of geospatial data. The system enforces that all data meet the stringent quality control standards based upon best practices associated with current National Emergency Number Association (NENA) standards.
- These data quality validation checks are built into the system but which ones are enforced are initially configurable for the end-user.
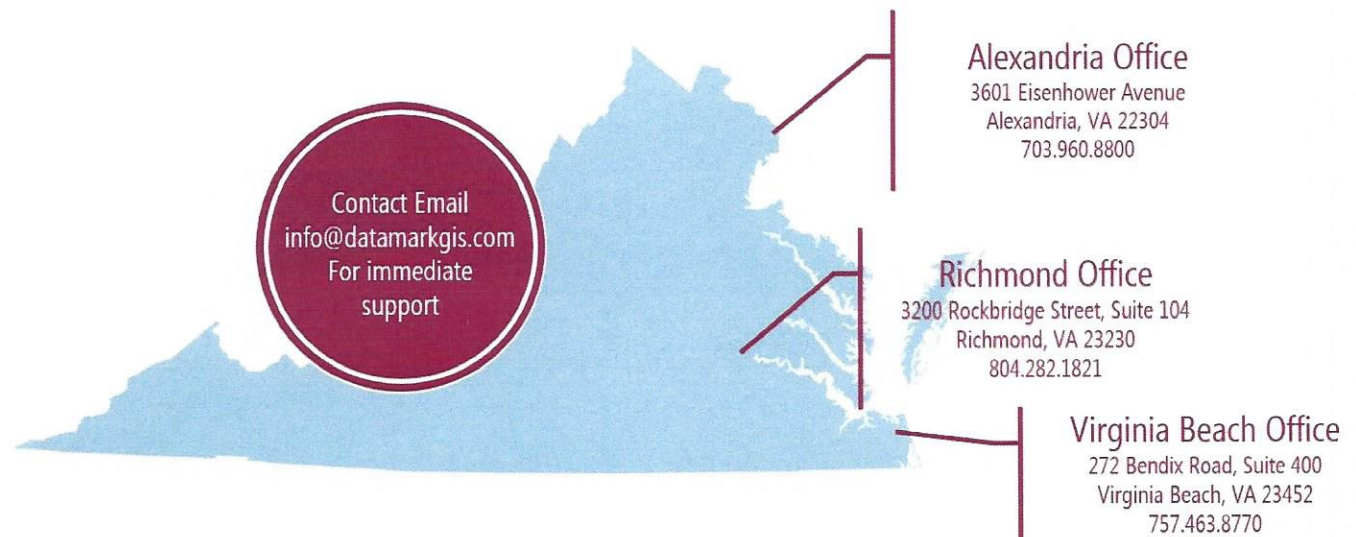

Tasks

- Culpeper County and Town address data on-boarding
- Customer training

Deliverables

- DataMark DX (SaaS):
  - Access to online QC tool
  - Training and documentation
- NG9-1-1 GIS data on-boarding to SaaS DataMark DX
- Ability to run repeatable QC checks and fix errors
  - VITA PSAP Grant Focus Area 1-4: ALI to GIS QA/QC checks on current data to minimum 98% Match Rate
  - VITA PSAP Grant Focus Area 5-8: GIS Road Centerline Analysis Checks to 99% Match Rate
  - VITA PSAP Grant Focus Area 9-11: GIS Address Point Analysis Checks to 99% (98% for Focus Area 10) Match Rate
- Customer Training on how to fix and maintain centerline and address point data
- Optional: Michael Baker's GIS Technicians will fix address data using estimated level of effort on a "not to exceed" basis.

4. Local offices

Our Local offices allow you access to our team of NG9-1-1 Address experts that can answer your technical questions. We understand that many localities have limited staffing resources and will require accessible, reliable, and dependable technical support.

Contact Email
info@datamarkgis.com
For immediate
support

Alexandria Office
3601 Eisenhower Avenue
Alexandria, VA 22304
703.960.8800

Richmond Office
3200 Rockbridge Street, Suite 104
Richmond, VA 23230
804.282.1821

Virginia Beach Office
272 Bendix Road, Suite 400
Virginia Beach, VA 23452
757.463.8770

COST PROPOSAL
Culpeper, Virginia

TABLE 2: Cost Proposal	
1. GIS Addressing Assessment Report	$12,840
2. DataMark Address Completeness/Assessment/Correction	$14,550
3. DataMark DX Address Editing and Clean-up Support Services	$11,950
4. Contingency (10%)	$3,934
TOTAL	$39,340